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## MEDICAL DIRECTIVE –

### Advanced Life Support (ALS): Intraosseous (IO) Cannulation and Infusion

Approved by/Date: Medical Advisory Committee – June 23, 2015

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#### Authorizing physician(s)

- LHO - Code Blue, Emergency Department & Critical Care Physicians
- LHB - Emergency Department and Critical Care Physicians
- LHPP - Emergency Department Physicians

#### Authorized to who

An Emergency/Critical Care Registered Nurse (RN), Paediatric/NICU Registered Nurse (RN) and Registered Respiratory Therapist (RRT) regulated by the Regulated Health Professions Act who has successfully completed the education for IO insertions.

#### Patient Description / Population

All adult patients within Lakeridge Health who are in a potentially life threatening situation and IV access has been unsuccessful after 2 attempts or 90 seconds of searching for a suitable vein (including prehospital).

All pediatric patients within Lakeridge Health who are in cardiac arrest or in a potentially life threatening situation, responsive to pain and IV access has been unsuccessful, preferably by a clinician experienced in pediatric IV insertion.

#### Medical Directive Description/Physician's Order

Insertion of an IO needle into the bone marrow using a battery-powered hand held drill into the proximal tibia, distal tibia or the proximal humerus site. IO Infusion for alert patients, who are in potentially life threatening situations, is noted to cause severe discomfort and pain prior to the rapid bolus. Therefore:

- Adults: administer 60 mg (3 mL) of preservative free, EPINEPHrine free, 2% Lidocaine IO over 1 - 5 minutes (longer wait time = more effective freezing), followed by a 10 mL rapid flush of 0.9% Sodium Chloride.
- Pediatrics: administer 0.5 mg/kg preservative free, EPINEPHrine free, 2% Lidocaine IO, to a maximum of 60 mg, injected slowly over 1-5 minutes prior to a rapid 5 - 10 mL bolus of 0.9% Sodium Chloride.

**Note: there is a rare but life-threatening risk of methemoglobinemia in patients following lidocaine administration. If patients exhibit sudden signs of worsening hypoxia and cyanosis **stop lidocaine administration and contact the physician immediately.****

Deliver fluids and medication as ordered through IO push, utilizing a pressure bag at 300 mmHg or a syringe pump.

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Document Sponsor/Owner Group: Emergency/Critical Care

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#### **Specific conditions/circumstances that must be met before the Directive can be implemented**

The physician must not be immediately available.

#### **Contraindications to the implementation of the Directive**

##### **The following are contraindications to the insertion of an IO:**

1. Any limb fractures at insertion site i.e. lower leg fractures
2. Excessive tissue or absence of adequate anatomical landmarks
3. Infection at the area of insertion
4. Previous orthopedic procedure at the site
5. Prosthetic limb or joint as the site of insertion.
6. Patient capable of consent refuses treatment or substitute decision maker refuses on behalf of the patient. **Note: If a patient or substitute decision maker refuses treatment contact the physician immediately to determine plan of care.**

##### **The following are contraindications to the administration of Lidocaine only:**

1. Any documented allergy to Lidocaine is a contraindication to the administration of lidocaine **only**.
2. The use of any form of lidocaine other than preservative free, EPINEPHrine free, 2% Lidocaine is contraindicated for use in this procedure.

**Note: An IO may still be inserted, but NO Lidocaine administered, if the above contraindications exist.**

#### **Identify relevant Delegated Control Act or Added Skill associated with this Directive**

Performing a procedure below the dermis.

#### **Documentation requirements**

Documentation of the Medical Directive – “Intraosseous Insertion” will be provided on the physician order sheet and in the health professional’s documentation section of the patient chart.

#### **Review/Evaluation Process (how often/by who)**

The medical directive will be reviewed every 2 years by the Resuscitation Committee and the Section Chief of Critical Care.

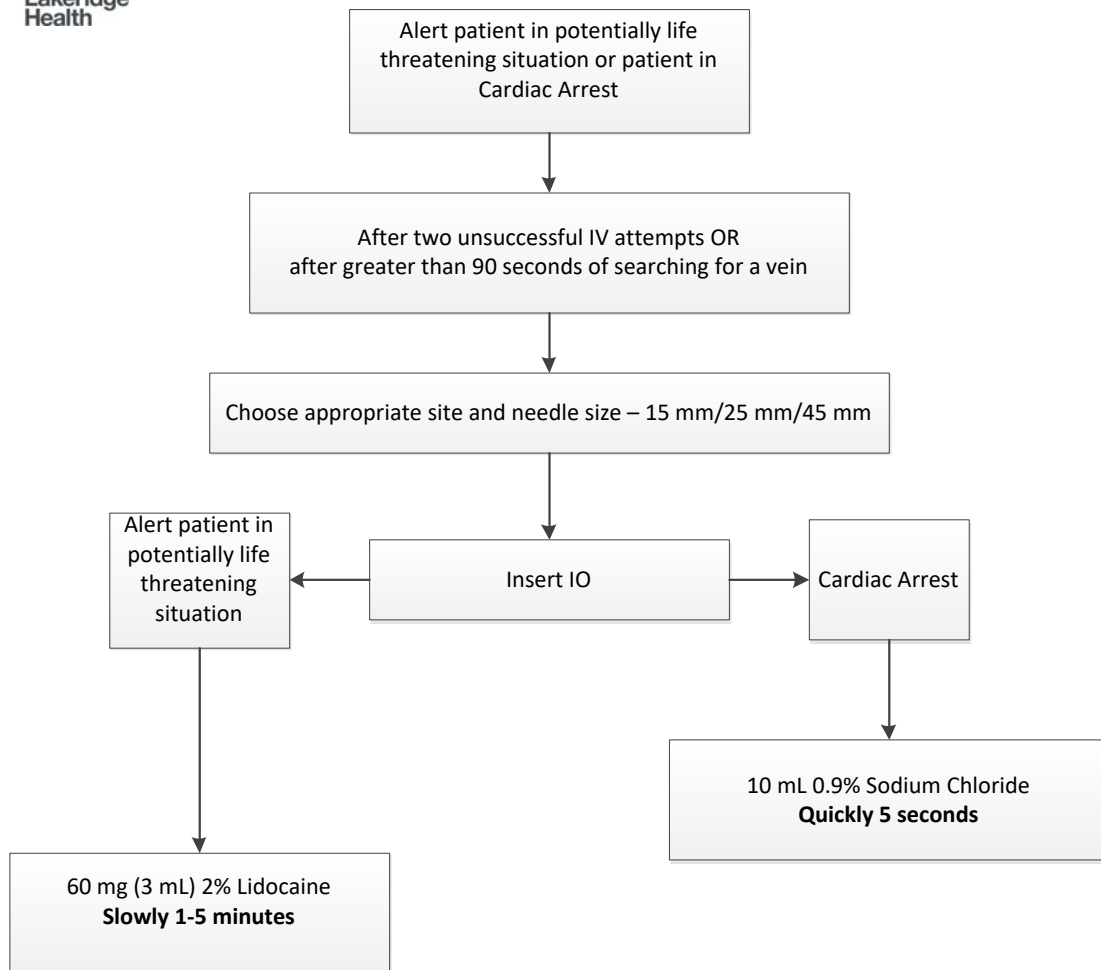


**Related Documents**

- EZ – IO training package posted on the WAVE.
- EZ – IO educational video <http://www.youtube.com/watch?v=PL3DMY1ZIn0>
- EZ – IO test

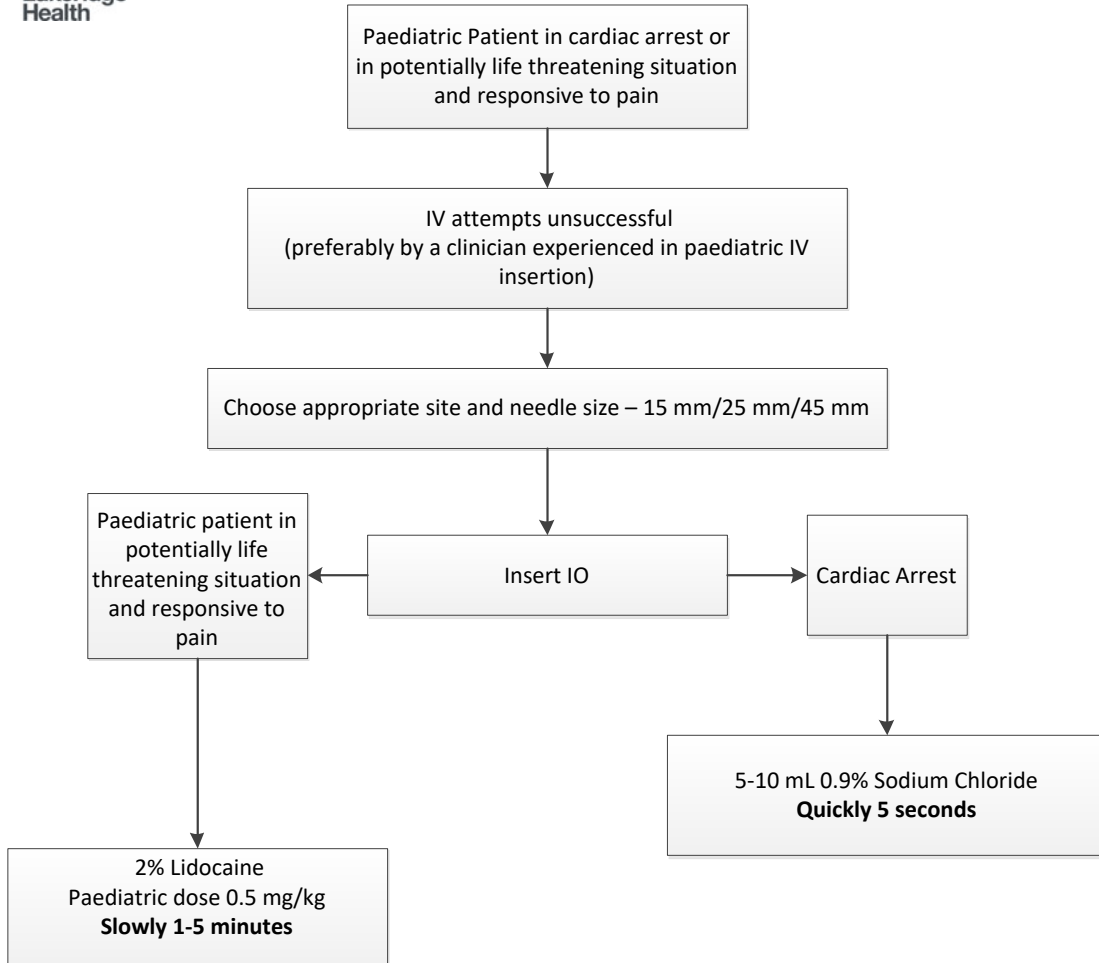


**Adult EZ-IO Algorithm**





### Paediatric EZ-IO Algorithm





## References

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Intraosseous Infusion. Paediatric Medical Directives & Standing Orders for All Flight Paramedics, Critical Care Land Paramedics & Paediatric Transport Paramedics / RNs. ORNGE. Revised April 2010.

Paediatrics – Critical Care. Intraosseous Cannulation. Author: William Gluckman, DO, MBA, FACEP, Rene J Forti, MD, Sangeeta Lamba, MD; Aug 27, 2010

Pain Management and the Use of Intraosseous. Patient Care. Journal of Emergency Medicine. Montez, D et al. Sept. 2010.

<http://jems.com/article/intraosseous/pain-management-use-io>

Intraosseous Overview. The University of Texas Medical Branch. June 2010.  
<http://www.utmb.edu/edlab/EZIO/EZIOPP.pdf>

Lexicom – 2% preservative and epinephrine free Lidocaine Hydrochloride.

Aveda Pharmaceuticals, Belleville, Ontario Canada, 2% preservative and epinephrine free Lidocaine Hydrochloride.